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Title of the Invention: Waterproof Footwear

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FR-A-2 576 195

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Description

The invention relates to footwear according to the preamble of Claim 1, and a method for its production according to the preamble of Claim 25.

Document FR-A-2 576 195 discloses a shoe whose upper is joined to an insole via a seam. The insole is permeable so that during injection molding of the outsole liquid plastic can extend through the insole. A midsole is situated above the insole, which is covered by a cover layer. The midsole can be provided on the bottom with anchoring holes into which the liquid outsole plastic can penetrate during injection molding of the outsole, specifically, through the permeable insole. This leads to anchoring between the molded-on soles and the intermediate layer. During the injection molding process, liquid plastic also reaches the inside of the upper in the region of the seam. As a result of this, the inside of the lower end of the upper and the seam are anchored in the plastic of the outsole.

However, in footwear of this already known type a second inner sole or sock-like insert is required, so production costs are significantly increased. In a waterproof version of this footwear the upper material must be made water-impermeable, with the result that liquid sweat cannot be led off but accumulates instead, which creates an unpleasant wearing sensation.

There are waterproof but water vapor-permeable, microporous membrane materials that have been increasingly used in recent years for production of waterproof articles of clothing. Because of their water vapor permeability, pleasant wear properties are obtained. Such membrane materials consist, for example, of expanded polytetrafluoroethylene (ordinarily abbreviated PTFE; this term is adopted here as well), polyester or microporous polyurethane coating.

Such membrane materials have also recently been used to produce waterproof footwear. In this case, at least the shoe upper is lined on the inside with such a membrane material, which in the present context is preferably referred to as a functional layer. An example is shown in EP-A3-0 080 710. The lining is generally formed by a liner in the form of a laminate, which has the functional layer and a textile layer on the side facing the shoe interior.

However, problems occur with seams that form as a result of sewing the shoe upper to the liner, and to the insole if the latter is used.

The functional layer is perforated and is water-permeable at the sewing sites.

To overcome this problem, sock-like inserts have already been used between the upper and outsole or insole, on the one hand, and internal liner, on the other hand. Since this sock-like insert can be shaped by sealing, it need not have seam holes. However, this method is quite demanding in production if an attempt is made to adequately adapt the sock-like inserts to the corresponding shoe shape.

Another known method involves injection-molding the bottom of the footwear or the insole and lower region of the upper, lined with a functional layer and optionally sewn to the insole, with a rubber or plastic sole that generally forms the outsole. The connecting seam is then included between the upper and the liner, and optionally the outsole made of a rubber or plastic sole, i.e., a waterproof material.

It should be noted here that in the present context the term "plastic sole" is used for short and is also assumed to include natural or synthetic rubber.

The upper ordinarily consists of leather or a textile fabric, for example, synthetic fiber.

The molded plastic sole does seal the sewing area between the functional layer and the upper, and optionally the insole, against direct occurrence of water. The aforementioned upper materials, however, have the property that they transmit water in their length direction, which is especially true for leather uppers. Capillary effects participate in the transmission of water. If the upper area not covered by the plastic sole becomes wet, the water moves along the upper because of this longitudinal conduction effect up to the seam situated within the molded-on plastic sole, where it can then penetrate the functional layer at the sewing holes. Ordinarily, the functional layer is situated within a laminate, which is coated on the side facing the upper with a protective textile, and on the inwardly facing side with a liner material. During ordinary mass production of shoes, formation of water bridges on the lower end of the upper and liner is difficult to prevent at economically acceptable expense. These can be formed by threads that protrude from the cut-off liner part and extend beyond the cut-off end of the functional layer to the upper material. When, in particular, the upper material consists of textile fabric, the upper end and the liner end may not be cut off at precisely the same height, so that threads or parts of the textile upper material bridge the cut-off end of the functional layer and form a moisture bridge to the liner of the footwear. The liner material that lines the functional layer of the interior of the shoe is ordinarily absorbent and water-conducting. The water that has penetrated along the upper and extended through the

seam and/or the aforementioned water bridges then moves along the liner into the interior of the shoe. According to experience, it only takes about 10 minutes for the inner liner to become wet, once the outside of the footwear becomes wet.

An attempt to achieve better water sealing in shoes without a waterproof, water vapor-permeable functional layer is described in DE-GM 1 680 553. The shoe described in this document has a sole frame that is formed around the shoe periphery by a peripheral part of an insole and a peripheral region of the upper material firmly sewn to it. The upper material is also sewn to the insole in the region of this sole frame.

By means of this seam, a textile strip is sewn onto the top of the upper material in the region of the sole frame. The purpose of this textile strip is to obtain better adhesion strength of the plastic sole molded onto the insole and sole frame. The top of the upper material often consists of a material to which the plastic sole material only poorly adheres, so that water can penetrate between the outside of the upper and the poorly adhering plastic sole. A situation can be achieved with the textile strip in which the plastic sole adheres better to the top of the sole frame. However, no improvements are achieved by this in terms of ingress of water in the upper material because of the aforementioned capillary effects. In contrast, the strongly water-conducting textile material facilitates ingress of water.

If the shoe known from the aforementioned document were to be lined with a waterproof, water vapor-permeable functional layer, which would be firmly sewn in the usual manner in the region of the sole frame between the upper material and the insole, water bridges could not be prevented from forming through threads or textile parts of the upper material and/or the inner liner that lines the functional layer, which can bridge the cut-off end of the functional layer. In contrast, by using a textile strip for better adhesion of the plastic sole material, the likelihood that such water bridges will occur as a result of threads or textile pieces is increased. Another consideration is that during molding of the plastic sole, the liquid plastic sole material can penetrate to a certain degree into the seam holes of the sole frame. The likelihood that the plastic sole material will penetrate deep enough into the seam holes to also penetrate the seam holes of a functional layer (not provided in the aforementioned document) because of the presence of the covering formed by the upper material is lower with the textile strip than without such a textile strip. The danger that water will move downward along the upper material and reach the inner

liner of the footwear by overcoming the seam holes of the functional layer is therefore higher than without the use of the textile strip.

An object of the invention is to provide footwear according to the preamble of Claim 1 and to provide a method for its production in which the footwear is created so that water bridges from the upper to the inner liner are avoided and the production costs are reduced.

This object is attained according to the invention by footwear according to the features of the characterizing part of Claim 1 and by the method that can be deduced from Claim 25 and is designed for production of the footwear according to the invention.

Advantageous modifications of the objects of the claims can be deduced from dependent Claims 2 to 24 and 26 and 27, which refer back to these claims.

Owing to the fact that the lower region of the upper adjacent to the outsole is formed according to the invention by a porous connecting material (which in the present context is assumed to include perforated, porous, and mesh-like material), the liquid material of the plastic sole can be extended to the functional layer or the laminate that has the functional layer when molded onto the upper, and optionally onto the insole. Because of this, a situation is achieved in which the molded-on plastic sole material seals the holes of the connection seam between the insole, the functional layer and the upper, and optionally the insole.

In a particularly preferred embodiment, a spacer having good permeability for the liquid plastic sole material is arranged between the functional layer (a term which is assumed to include a laminate having the functional layer in the present context) and the lower region of the upper. This prevents impermeable parts of the connecting material from covering the seam holes and hampering or preventing access of liquid plastic sole material to the seam holes. During injection of the plastic sole, pressures around 5 atm are used so that the upper material and the connecting material are forced against the functional layer with relatively high pressure.

The procedure according to the invention is such that the upper is not formed above the liner and optionally the insole-connecting seam, and the space between the lower end of the upper and the sewing site is bridged with the porous connecting material. The porous connecting material is then joined on one end to the lower end of the actual upper material without being sewn at this site to the functional layer. On the other end the porous connecting material is firmly sewn to the functional layer on the insole. It is thereby possible to completely prevent formation

of water bridges that might still exist to a limited degree in the lower region of the perforated upper material above the remaining upper material.

In the solution, the porous connecting material can simultaneously serve as a spacer; for example, as an artificial fiber mesh with mesh openings at least in the range of 1.5 mm. If the mesh does not have sufficient intrinsic rigidity, it can be provided with an adhesive, and made sufficiently stiff thereby.

If the porous material is formed as a mesh, monofilament mesh fibers should be used for the mesh. When multifilament mesh material is used, there is a danger that water-conducting capillaries can form between the individual fibers. Whereas capillaries of a monofilament mesh are sealed by molding of a liquid plastic sole material, capillaries between multifilament mesh fibers remain without being sealed and can also conduct water after molding of the plastic sole material.

The porous connecting material can extend beyond the upper edge of the molded-on plastic sole. A drainage function is therefore achieved. If water reaches between the upper and the functional layer in the upper region of the upper because, for example, the person wearing the footwear is running through water, this water can flow off over the part of the porous connecting material lying above the plastic sole.

A region situated above the functional layer and optionally the insole seam, and preferably extending to the sole upper edge of the plastic sole, can be perforated in order to obtain a water runoff capability in this region of the sole. This has the advantage that drainage can occur up to right above the functional layer, and optionally the insole seam sealed with the sole material.

Another advantageous feature consists of perforating both the upper material and the plastic sole in the region above the functional layer, and optionally the insole seam. This leads to an optimal drainage function for water that has reached the upper material and the area between the upper and the functional layer.

By using a spacer between the lower region of the upper and the functional layer, a situation is also achieved in which the material of the plastic sole lies sufficiently high in the intermediate space between the upper and the functional layer or laminate liner, possibly beyond the upper edge of the molded-on plastic sole. This virtually rules out the possibility that fissure

channels capable of forming moisture-conducting channels to the sewing site will form in the material of the plastic sole.

The invention is equally suited for shoes with insoles, for shoes without insoles and for shoes provided according to the polypintch method[1] with an insole only in the front part of the shoe.

In a shoe with a continuous insole, the lower end regions of the upper and the liner containing the functional layer are firmly sewn to the outer periphery of the insole, the end regions of the upper and the liner aligned perpendicular to the longitudinal plane of the insole. The plastic sole is molded from the bottom onto the insole, and from the bottom laterally onto the lower region of the upper.

In a shoe without an insole, which is produced according to the string-lasting method, the lower ends of the upper and the liner that contains the functional layer are held together with guide loops in which a pull cord is used to carry out the string-lasting operation. The liner and the upper can be fastened to each other by means of the guide loops and/or by means of a seam, set off from the guide loops. To produce a shoe according to this method, the lower end of the upper is wrapped around a last with the porous connecting material and the liner fastened thereto, and pulled together around the last on the bottom of the last by means of the pull cord that runs through the guide loops. On the bottom of the last there is a parting agent that prevents adhesion of the plastic sole material to the bottom of the last. The outsole is now molded from the bottom onto the last or the upper region partially covering the bottom of the last, so that it covers the lower part of the upper region lying against the side of the last.

In this type of footwear, the porous connecting material, which represents the connection between the actual upper part and the upper end provided with the guide loops, prevents a water bridge from forming between the actual upper part and the inner liner via the upper end provided with the guide loops. In this type of footwear, the likelihood of water bridges overcoming the functional layer is particularly high if the porous connecting material were not present, because

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1 **Translator's Note**: the German source term "Polypintch Methode" does not exist in any dictionary nor does a search of the internet generate one single hit for this term. The English translation "polypintch method" likewise does not generate any hits, so we cannot offer a translation of which we are certain that it is correct. It should be noted, however, that the English-language claims already present in the European patent also use the term as "polypintch."

the guide loops are ordinarily produced from threads that conduct water and could form such water bridges.

The present invention is also suitable for shoes that are produced according to the polypinch method. In this case only the front part of the footwear extending roughly to the medial arch is provided with an insole, whereas the rest of the footwear has no insole. In the region of the insole, the lower region of the upper and the liner sewn thereto are wrapped around the lower edge of the insole. In the region without the insole, the lower regions of the upper and the liner sewn thereto are aligned perpendicular to the plane of the outsole. At least in the region without the insole, the last is again provided with a parting agent, which prevents the liquid plastic sole material from adhering to the last. To produce the outsole, liquid plastic material is molded from the bottom onto the insole and the last so that the plastic material also covers the sides of the upper to a certain height. Here again, the porous connecting material on the lower end of the upper prevents water bridges from being formed from the actual upper material around the functional layer up to the liner.

The invention is now further explained by means of embodiments. The schematic footwear diagrams are as follows.

Figure 1 depicts a shoe of a known type;

Figure 2 depicts a shoe according to the first embodiment of the invention;

Figure 3 depicts a cross section through the shoe produced by means of the string-lasting method;

Figure 4 depicts a bottom view of such a string-lasting shoe;

Figure 5 depicts a bottom view of a shoe produced according to the polypintch method;

Figure 6 depicts a cross section along line 1-1 in Figure 5 and

Figure 7 depicts a cross section along line 2-2 in Figure 5.

According to Figure 1, a shoe of the known type has an upper S, which consists of leather or a textile fabric, preferably made of plastic. The inside of upper S is lined with a laminate L, which assumes the function of an inner liner and has a waterproof and water vapor-permeable functional layer or membrane M. The membrane is lined on the side facing the upper S with a textile T, and on the side facing the shoe interior with a liner material F. The liner material F and the textile fabric T form a mechanical protection for the functional layer M. On its lower end, the

composite of the upper S and the laminate L is sewn to the edge of an insole B, and the seam is denoted N. On the bottom of the insole B and in the lower region of the upper S sewn thereto, a sole K made of any appropriate waterproof plastic is molded on. The upper edge O of the sole K is high enough that the seam N is enclosed by the sole K. The seam N is therefore sealed against direct ingress of water.

Water that occurs in the region of the upper S lying outside of the sole K, however, can pass along the upper on the inside of the sole K to the seam, pass through the seam holes there to the functional layer M and reach the interior of the shoe.

There is also the danger that during the cutting of the upper material and at least the liner L that has a textile layer, threads or textile parts will remain protruding and form a connection between the upper S and the lining material F that bridges the functional material F of the liner L. If the upper S becomes wet and conducts water to the end of the upper, the water can reach the liner material F via the water bridges, so that the liner material F becomes wet.

This is prevented in the embodiments of the invention described below.

In the embodiment of the invention depicted in Figure 2, the upper S does not extend to the insole B, but the lower end of the upper has a spacing relative to the edge of the insole. This spacing is bridged with a perforated or porous connecting material V. The upper edge of the connecting material B is firmly sewn to the lower edge of the upper S, specifically, along a seam N1. The laminate L, however, is not sewn to the upper at this site. The other end of the connecting material V is sewn together with the lower end of the laminate L to the insole B, specifically, along a seam N2.

When the sole K is molded on, the liquid sole material passes through the pores, holes or meshes of the connecting material to the outside of the laminate L so that the holes of the seam N2 are sealed with the sole plastic.

Owing to the fact that the lower region of the upper is formed by the perforated or porous connecting material V positioned on the actual upper, water transmitted from the actual upper cannot reach the seam that connects the upper and the liner insole, so that water bridges that are formed by the seam and by the threads or textile pieces bridging the functional layer cannot have an effect because the water conducted by the actual upper cannot reach them.

A perforated or porous spacer can be inserted between the porous connecting material and the laminate L. The spacer keeps the laminate in the porous connection V at a distance from each other, and can be penetrated by the liquid plastic sole material during molding on of the sole K. Because of the spacer, more plastic sole material can reach between the upper and the laminate. In addition, when the spacer is used, the molded-on plastic material rises to a higher region between the upper S and the laminate L than would be possible without the spacer. Because of the high injection pressure during molding of the sole K, the sealing lip of the injection mold in the region of the upper edge O of the sole K must be forced with a correspondingly high pressure onto the upper. Without the spacer, only correspondingly less plastic material would be able to reach between the upper S and the laminate L. The presence of more material in this intermediate space increases the likelihood that fissure channels in the plastic material will not become moisture channels.

If a spacer is provided, it can protrude beyond the upper edge of the sole K. The entire upper S can even be lined with the spacer, which makes the shoe more stable and simplifies manufacturing.

Preferred materials for the sole K are polyurethane (PU), polyvinyl chloride (PVC) and transparent rubber (TR).

A mesh material, which can be sewn, on the one hand, and is permeable to the liquid plastic sole material during molding, on the other hand, can be used for the connecting material and spacer. A preferred material is artificial fiber in mesh form with a mesh size of preferably at least about 1.5 mm. The connecting material on the spacer should preferably consist of monofilament material in order to avoid water-conducting fibrils. The fibrils form channels that cannot be sealed by the plastic material during molding. Such fibrils occur in multifilament materials. Polyamide and polyester are suitable as artificial fibers. The connecting material and spacer can be coated with adhesive in order to increase the rigidity and lifetime of the structure.

Figures 3 and 4 show an embodiment of a shoe produced by the string lasting method according to the present invention. Figure 3 shows a cross-sectional view, and Figure 4 shows a bottom view before application of the plastic sole K.

In this production method, the perforated or porous connecting material V is firmly sewn to the lower end of the upper by means of a seam N1. The connecting material V and the liner L

that contains the functional layer are sewn along their free ends, specifically, by means of guide loops FS. A pull cord ZS passes through the guide loops. Before injection of the plastic sole K, the upper S and the liner L are wrapped around a last, and the lower end regions of the upper S and the liner L are pulled together by means of the pull cord ZS until the entire upper S with the liner L lies essentially against the last. The plastic sole K is then molded on from the bottom, in which case the bottom of the last is provided with a parting agent. After removal from the last, the lower region of the liner F and the region occupied by the interposed plastic sole K are lined with a cover sole.

In this embodiment, it is also possible to insert a spacer between the connecting material V and the liner F.

Figures 5 to 7 show an application of the invention to a shoe produced according to the polypintch method. Figure 5 shows a bottom view of such a shoe before molding of the plastic sole. Figures 6 and 7 are cross sections through the shoe along lines 1-1 and 2-2 after the plastic sole has been molded on.

In the region of an insole B, which extends from the front end of the shoe to the medial arch of the foot, the lower regions of the upper S and the liner L are wrapped around the lower edge of the insole B. In the lower region of the shoe, which has no insole, the lower ends of upper S and the liner L are aligned perpendicular to the plane of the outsole. In the region occupied by the insole B, the connecting material V that extends to the upper material is situated beneath the insole. In the region without the insole, the connecting material V is situated in the lower-side region of the upper S. The plastic sole is molded onto the bottom of the insole in the insole region, to the region of the upper folded beneath the insole, and to the last provided with the parting agent in the region outside of the insole. After being removed from the last, the shoe is lined with a cover sole.

Shoes produced according to the polypintch method with a waterproof, water-vapor-permeable functional layer are disadvantageous in that in normal production methods it is scarcely possible to cut off upper material on the separation site between the insole and other regions sufficiently uniformly, so that the non-textile upper material or textile liner material or its threads protrude beyond the cut-off end of the functional layer and form a water bridge there. Because the lower end region of the upper is formed by a connecting material V positioned on

the upper S, the water-conducting zones formed by the material of the actual upper S cannot continue to the cutting end of the liner, and hence to the functional layer, so that no effect is produced by the existing water bridges located above the seam holes and threads as well as the textile pieces that bridge the cutting end of the functional layer.

Claims

1. Footwear comprising
   (a) an upper (S),
   (b) a lining (L) lining the upper (S),
   (c) a waterproof plastics sole injection-molded to the lower portion of the upper (S),
   (d) at least the lower portion of the upper (S) which is located in the region of the outsole being sewn via a seam (N2) to a porous material (V) adapted to be penetrated by the plastics sole material which is liquid during the injection molding operation,
   characterized in
   (e) that the lining (L) is provided with a microporous functional layer (M) which is waterproof and permeable to water vapor,
   (f) that the upper material proper terminates at a distance from the lower end of the lining (L), and
   (g) that the end of the upper material proper is connected via a porous connecting material (V) to the lower end of the lining (L),
   (h) the porous connecting material (V) having one end sewn via a seam (N1) to the upper material (S) proper but not to the lining (L) and having the other end sewn via the seam (N2) to the lining (L).

2. Footwear according to claim 1,
   characterized in that at least in the region of the seam (N2) connecting the upper (S) and the lining (L) a porous spacer (A) is secured between the upper (S) and the lining (L), said spacer being adapted to be penetrated by the plastics sole material which is liquid during the injection molding operation.

3. Footwear according to claim 2,
   characterized in that the spacer (A) is secured at least by means of the seam (N2) joining upper (S) and lining (L).

4. Footwear according to at least one of claims 1 to 3,
   characterized in that the porous connecting material (V) is additionally designed as a spacer.

5. Footwear according to at least one of claims 1 to 4,
   characterized in that the porous connecting material (V) extends from the lower end of the lining (L) beyond the top edge of the plastics sole (K).

6. Footwear according to at least one of claims 1 to 5,
   characterized in that the plastics sole (K) is permeable to water vapor.

7. Footwear according to at least one of claims 1 to 6,
   characterized in that the material of the plastics sole (K) is selected from polyurethane, transparent caoutchouc and polyvinyl chloride.

8. Footwear according to at least one of claims 1 to 7,
   characterized in that the lining is formed by a laminate (L) comprising a microporous functional layer (M) which is waterproof and permeable to water vapor, the side thereof that faces the upper material being provided with a mechanically protecting textile layer (T) and the side thereof that faces the inside of the footwear being provided with a mechanically protecting, selectively warming lining layer (F).

9. Footwear according to at least one of claims 1 to 8,
   characterized in that the functional layer (M) consists of a membrane of expanded polytetrafluoroethylene, of polyester or of a microporous polyurethane coating.

10. Footwear according to at least one of claims 1 to 9, characterized in that the upper (S) consists of a textile fabric or of a plastics fabric.

11. Footwear according to at least one of claims 1 to 10, characterized in that the upper (S) consists of leather.

12. Footwear according to at least one of claims 1 to 11, characterized in that the porous connecting material (V) connecting the upper (S) to the end of the lining (L) is a net of monofil synthetic fibers.

13. Footwear according to claim 12, characterized in that the mesh aperture size is at least in the range of approx. 1.5 mm.

14. Footwear according to claim 12 or 13, characterized in that the material of the net is selected from polyamide and polyester.

15. Footwear according to at least one of claims 12 to 14, characterized in that the net is provided with an adhesive stiffening it.

16. Footwear according to at least one of claims 1 to 15, characterized in that the lower end portions of the upper (S) and of the lining (L) are directed substantially perpendicular to the outsole bottom side.

17. Footwear according to at least one of claims 1 to 13, characterized in that the lower end portions of the upper (S) and of the lining (L) are directed substantially parallel to the outsole bottom side and at least the portion of the upper (S) extending parallel to the outsole bottom side is formed by a porous connecting material (V).

18. Footwear according to at least one of claims 1 to 17, characterized in that the lower end portions of the connecting material (V) and of the lining (L) are sewn to an insole (B) having the outsole (K) injection-molded to the bottom side thereof.

19. Footwear according to claim 18, characterized in that in the insole (B) extends only across part of the length of the footwear according to the polypintch method.

20. Footwear according to claim 19, characterized in that the insole (B) extends from the front end of the footwear approximately to the medial arch thereof.

21. Footwear according to claim 19 or 20, characterized in that the lower end portions of the connecting material (V) and of the lining (L) are directed in accordance with claim 16 in the footwear portion not provided with the insole (B), and are directed in accordance with claim 17 in the portion provided with the insole (B).

22. Footwear according to at least one of claims 1 to 15 or 17, characterized in that the lower end portions of the connecting material (V) and of the lining (L) are turned in according to the string lasting method and are provided at their turned-in ends with guide loops (FS) for a pull string (ZS).

23. Footwear according to claim 22, characterized in that the turned-in ends of the connecting material (V) and the lining (L) are sewn to each other by means of the guide loops (FS).

24. Footwear according to claim 22 or 23, characterized in that the turned-in ends of the connecting material (V) and the lining (L) are sewn to each other outside of the guide loops (FS).

25. A method of making footwear according to at least one of the preceding claims, in which the upper (S) is lined with a lining (L) and a plastics sole (K) is injection-molded to the lower portion of the upper (S), in which the lower portion of the upper (S) located in the region of the plastics sole is sewn to a porous material (V) by means of a seam (N2), and in which liquid plastics sole material is injection-molded in such a manner that the liquid plastics material penetrates the porous material (V), characterized in

(a) that the lining (L) is provided with a functional layer which is waterproof and permeable to water vapor,

(b) that the lower end of the upper material proper is spaced from the lower end of the lining (L) and is extended with the porous material as connecting material (V),

(c) that the lining (L) and the end of the porous connecting material (V) remote from the upper material proper are sewn to each other at their lower ends via the seam (N2), and

(d) in that the plastics sole (K) is then injection-molded.

26. A method according to claim 25, in which the footwear is provided with an insole (B) extending at least across part of the footwear length, characterized in that the lower end of the porous connecting material (V) is sewn to the periphery of the insole (B) prior to injection-molding of the plastics sole material.

27. A method according to claim 25, characterized in that the lower ends of the porous connecting material (V) and of the lining (L) are provided with guide loops (FS) for a pull string (ZS) guided therein, that the lower portions of the connecting material (V) and of the lining (L) are pulled in around a last according to the string lasting method, and that liquid plastics sole material is then injection-molded to the pulled-in portion of the connecting material (V) and the bottom side of the last which is provided with a separating agent.

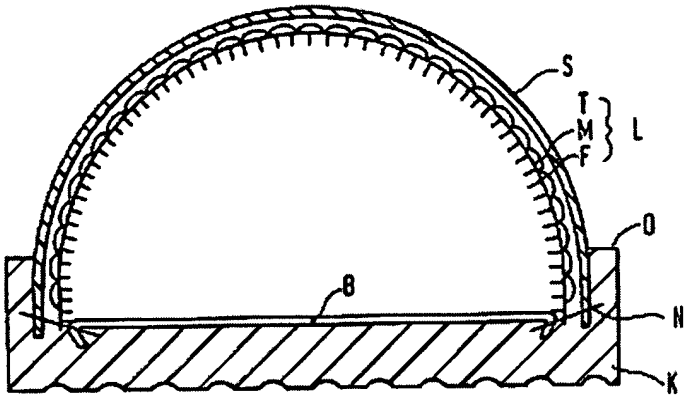

FIG.1

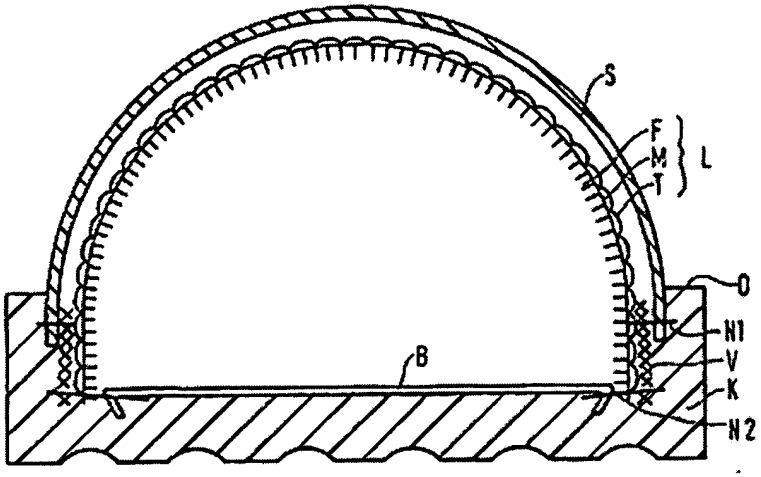

FIG.2

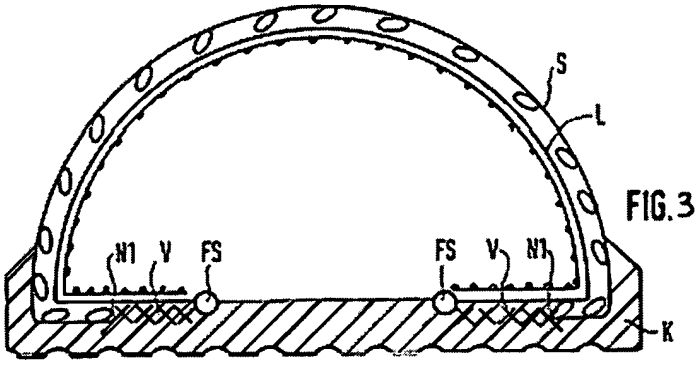

FIG.3

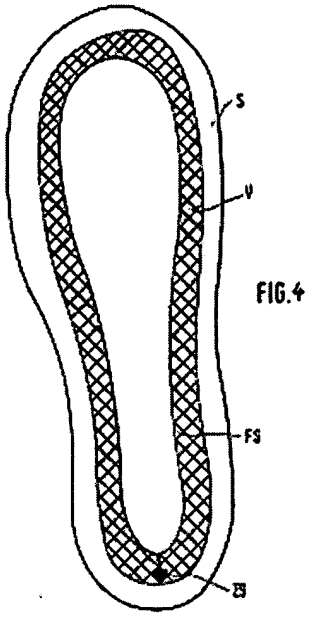

FIG.4

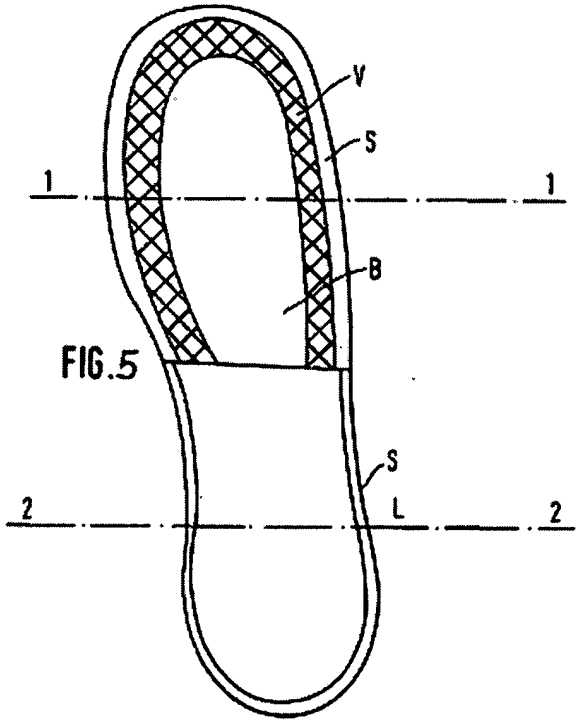

FIG.5

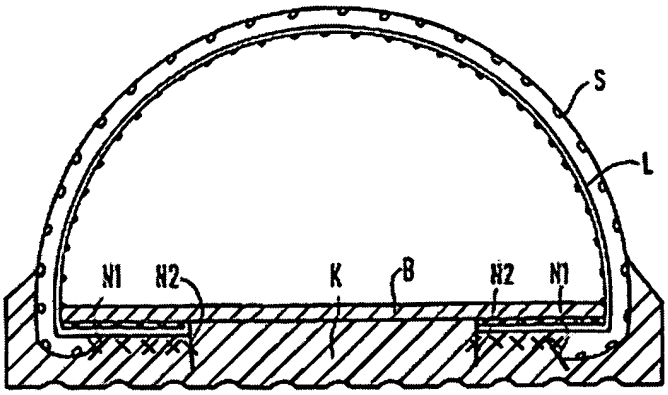

FIG.6

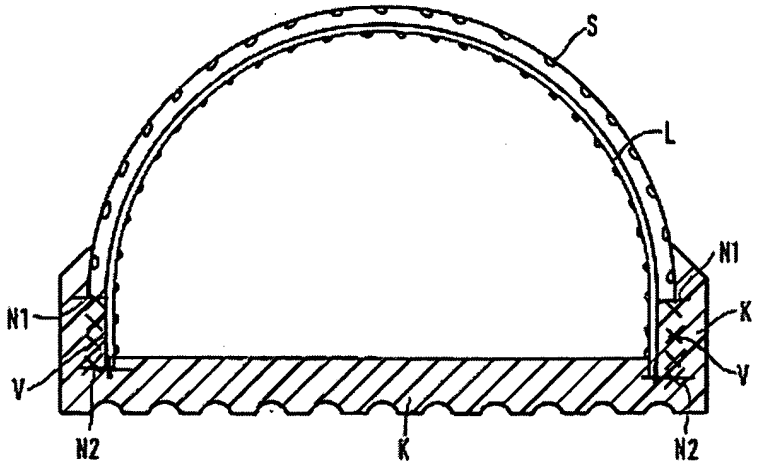

FIG.7

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